In the Claims

1-36. (cancelled)

37. (new) An instrument having:

a) a user controllable operating parameter having a number of possible user controllable parameter values;

b) a further operating parameter which is at least partially dependent on the user controllable parameter and which has any of a number of possible further parameter values, each corresponding to a respective one of the user controllable parameter values;

c) a memory for storing the possible further parameter values;

d) a selector for selecting one of the further stored parameter values for the further operating parameter in response to the selection by the user of the associated user controllable parameter value and for controlling the instrument accordingly;

e) whereby, if the selected user controllable parameter value is one for which there is no associated further parameter value stored in the memory, the instrument is operable to interpolate between further parameter values, stored in the memory, which correspond to user controllable parameter values in closest proximity to the selected user controllable parameter value to obtain a further parameter value corresponding to said selected user controllable parameter value;

f) a tuner for enabling a user to adjust the selected further parameter value, after a given user controllable parameter value has been selected, to obtain an adjusted further parameter value;

g) updating apparatus for updating the memory so that the adjusted further parameter value is selected if the given user controllable parameter value is again selected for the user controllable operating parameter.

38. (new) An instrument according to claim 37, in which the updating apparatus is such that if the selected, interpolated further parameter value is adjusted, the updating apparatus is operable to update each of said two values in the memory means so that said interpolation would have yielded the adjusted value in response to the selection of the same intermediate value of user controllable parameter had this occurred after said updating.

39. (new) An instrument according to claim 38, in which if the selected, interpolated further parameter is updated, only said two values in the memory updated.

40. (new) An instrument according to claim 37, in which the stored values of the further parameter are arranged in the memory in an index in which the stored values are arranged in an order corresponding to progressively changing values of the associated user controlled parameter.

41. (new) An instrument according to claim 37, in which the further operating parameter is one of a plurality of such parameters, values for all of which are stored in the memory.

42. (new) An instrument according to claim 37, in which the instrument is a charged particle beam instrument having a beam generator for generating charged particles and for subjecting said particles to an accelerating voltage to create a beam, and an alignment element for controlling the alignment of the beam, wherein said accelerating voltage constitutes the user controllable parameter and the further operating parameter comprises a setting for the alignment element.

43. (new) An instrument according to claim 42, in which the alignment element is a magnetic coil, and the associated further parameter is the value or relative value of current passed through the coil.

44. (new) An instrument according to claim 42, in which the alignment element is an electrode the value of the associated parameter being the voltage applied to the electrode.

45. (new) An instrument according to claim 42, in which the instrument has a plurality of different alignment coils, the further operating parameter is one of a plurality of such parameters, values for all of which are stored in the memory, and the further operating parameters comprise the currents in the coils or the relative current magnitudes in the coils.

46. (new) An instrument according to claim 42, in which the charged particle beam instrument is a scanning electron microscope, the beam generator comprising an electron gun having a cathode and an extraction electrode to which said accelerating voltage is applied, the alignment coils acting as gun alignment coils for controlling the alignment of the beam onto an electron optical axis of the microscope.

47. (new) An instrument according to claim 46, in which the electron microscope includes a plurality of apertures in the path of a beam to be generated by the beam generator, wherein the alignment coils are operable to direct the beam through any selected one of the apertures.

48. (new) An instrument according to claim 47, in which the magnitude of the accelerating voltage comprises one of a plurality of user controllable parameters, another such parameter being constituted by the identity of the aperture through which the beam is to pass.

49. (new) An instrument according to claim 48, in which the stored values are arranged in a list in which each said value is identified by a respective index code representative of the combination of accelerating voltage and aperture identity for which the stored value of alignment coil current or relative current at that entry applies.

50. (new) An instrument according to claim 49, wherein the list is part of a look-up table in which, for each index code, there are also stored values for additional further parameters applicable to the respective combination of aperture identity and accelerating voltage.

51. (new) An instrument according to claim 50, in which the instrument includes stigmator coils for correcting the distortion of the electron beam, the current for each such coil constituting a respective additional further parameter.

52. (new) An instrument according to claim 49, in which the instrument has a number of operating modes, each of which constitutes a user controllable parameter, the index code also being representative of the state of at least one of the operating modes.

53. (new) An instrument according to claim 37, wherein the instrument is a scanning charged particle beam instrument having a gun for generating the beam of charged particles, a plurality of apertures through any selected one of which the beam may pass, an accelerating electrode to which a voltage is applied to accelerate the particles away from the gun, and at least one alignment element for directing the beam through the selected aperture, wherein the further parameter values which are stored in a memory comprise values for the settings of the alignment element dependent on the voltage applied to the accelerating electrode and the choice of aperture.

54. (new) An instrument having:

a) a user controllable operating parameter having a number of possible user controllable parameter values;

b) a further operating parameter which is at least partially dependent on the user controllable parameter and which has any of a number of possible further parameter values, each corresponding to a respective one of the user controllable parameter values;

c) a memory for storing the possible further parameter values;

d) a selector for selecting one of the further stored parameter values for the further operating parameter in response to the selection by the user of the associated user controllable parameter value and for controlling the instrument accordingly;

e) wherein the stored further parameter values are arranged in the memory in an index in which the stored values are arranged in an order corresponding to progressively changing values of the associated user controllable operating parameter; and

f) updating apparatus for updating the memory so that the adjusted further parameter value is selected if the given user controllable parameter value is again selected for the user controllable operating parameter.

55. (new) An instrument having:

a) a user controllable operating parameter having a number of possible user controllable parameter values;

b) a further operating parameter which is at least partially dependent on the user controllable parameter and which has any of a number of possible further parameter values, each corresponding to a respective one of the user controllable parameter values;

c) a memory for storing the possible further parameter values;

d) a selector for selecting one of the further stored parameter values for the further operating parameter in response to the selection by the user of the associated user controllable parameter value and for controlling the instrument accordingly;

e) wherein the instrument is a charged particle beam instrument having a beam generator for generating charged particles and for subjecting said particles to an accelerating voltage to create a beam, alignment coils for controlling the alignment of the beam and a plurality of apertures, the alignment coils being operable to direct the beam through any selected one of the apertures the beam being directed through only one aperture at any one time, wherein said accelerating voltage and identity of aperture through which the beam is to pass are user controllable operating parameters and the further operating parameter comprises a current setting for the alignment coils, and wherein the stored further parameter values are arranged in a list in which each said further parameter value is identified by a respective index code representative of the combination of accelerating voltage aperture and identity to which the further parameter value applies;

f) updating apparatus for updating the memory so that the adjusted further parameter value is selected if the given user controllable parameter value is again selected for the user controllable operating parameter.

56. (new) An instrument according to claim 54, in which the instrument is a charged particle beam instrument having beam generating means for generating charged particles and for subjecting said particles to an accelerating voltage to create a beam, and an alignment element for controlling the alignment of the beam, wherein said accelerating voltage constitutes the user controllable parameter and the further operating parameter comprises a setting for the alignment element.

57. (new) An instrument according to claim 56 in which the charged particle beam instrument is a scanning electron microscope, the beam generating means, comprising an electron gun having a cathode and an extraction electrode to which said accelerating voltage is applied, the alignment coils acting as gun alignment coils for controlling the alignment of the beam onto an electron optical axis of the microscope.

58. (new) An instrument according to claim 57, in which the electron microscope includes a plurality of apertures in the path of a beam to be generated by the beam generating means, wherein the alignment coils are operable to direct the beam through any selected one of the apertures.

59. (new) An instrument according to claim 58, in which the magnitude of the accelerating voltage comprises one of a plurality of user controllable parameters, another such parameter being constituted by the identity of the aperture through which the beam is to pass.

60. (new) An instrument according to claim 59, in which the stored values are arranged in a list in which each said value is identified by a respective index code representative of the combination of accelerating voltage and aperture identity for which the stored value of alignment coil current or relative current at that entry applies.

61. (new) An instrument according to claim 60, in which the list is part of a look-up table, for each index code, there are also stored values for additional parameters

applicable to the respective combination of aperture identity and accelerating voltage.

62. (new) An instrument according to claim 61, in which the instrument includes stigmator coils for correcting the distortion of the electron beam, the current for each such coil constituting a respective additional further parameter.

63. (new) An instrument according to claim 55 wherein the list is part of a look-up table in which, for each index code, there are also stored values for additional parameters applicable to the respective combination of aperture identity in accelerating voltage.

64. (new) An instrument according to claim 63, in which the instrument includes stigmator coils for correcting the distortion of the electron beam, the current for each such coil constituting a respective additional further parameter.

65. (new) An instrument having:

a) a user controllable operating parameter having a number of possible user controllable parameter values;

b) a further operating parameter which is at least partially dependent on the user controllable parameter and which has any of a number of possible further parameter values, each corresponding to a respective one of the user controllable parameter values;

c) a memory for storing the possible further parameter values;

d) a selector for selecting one of the further stored parameter values for the further parameter in response to the selection by the user of the associated user controllable parameter value and for controlling the instrument accordingly;

e) wherein the instrument is an electron microscope comprising an electron gun having a cathode and an extraction electrode to which an accelerating voltage is applied to create a beam, and gun alignment coils for controlling the alignment of the beam onto an electron optical axis of the

microscope wherein said accelerating voltage constitutes the user controllable operating parameter and the further operating parameter comprises a setting for the gun alignment coils, and wherein the microscope has a number of operating modes, each of which also constitutes a user controllable operating parameter, an index code in the memory also being representative of the state of at least one of the operating modes;

f) a tuner for enabling a user to adjust the selected further parameter value, after a given user controllable parameter value has been selected, to obtain an adjusted further parameter value;

g) updating apparatus for updating the memory so that the adjusted further parameter value is selected if the given user controllable parameter value is again selected for the user controllable parameter.

66. (new) An instrument according to claim 65, in which the electron microscope includes a plurality of apertures in the path of a beam to be generated by the beam generating means, wherein the alignment coils are operable to direct the beam through any selected one of the apertures.

67. (new) An instrument according to claim 66, in which the magnitude of the accelerating voltage comprises one of a plurality of user controllable parameters, another such parameter being constituted by the identity of the aperture through which the beam is to pass.

68. (new) An instrument according to claim 67, in which the stored values are arranged in a list in which each said value is identified by a respective index code representative of the combination of accelerating voltage and aperture identity for which the stored value of alignment coil current or relative current at that entry applies.

69. (new) An instrument according to claim 68, in which the list is part of a look-up table, for each index code, there are also stored values for additional parameters applicable to the respective combination of aperture identity in accelerating voltage.

70. (new) An instrument according to claim 69, in which the instrument includes stigmator coils for correcting the distortion of the electron beam, the current for each such coil constituting a respective additional further parameter.